

From: Separation Science e-Learning <noreply@sepscience.com>
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To: Hanchett, James (DPH)
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FEATURED APPLICATION

Extraction of Synthetic Cannabinoids (SPICE) and Metabolites from Urine, Plasma and Whole Blood using ISOLUTE SLE+ Prior to LC-MS/MS Analysis **Biotage**

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This application note describes the extraction and quantitation of Cannabimimetic Naphthoylindoles (Synthetic Cannabinoids) and their metabolites (JWH Series) from various matrices using Supported Liquid Extraction (SLE). Synthetic Cannabinoids or SPICE as they are commonly known have become an increasing problem as one of the newest forms of illicit drugs being consumed today. These compounds bind to the cannabinoid receptors in mammals triggering similar euphoric symptoms as Tetrahydrocannabinoids (THC). Currently robust and fast analytical methods of analysis are required to aid in the screening and detection of this growing class of compounds. The recoveries obtained for the synthetic cannabinoids parent and metabolites ranged from 70-98 %.

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WHAT'S NEW

Reversed-Phase Analysis of a Monoclonal Antibody on an Accucore C4-150 HPLC Column **Thermo Fisher Scientific**

Accucore™ HPLC columns use Core Enhanced Technology™ to facilitate fast and highly efficient separations. The 2.6 µm diameter particles are not totally porous but have a solid core and a porous outer layer. The optimized phase bonding creates a series of high-coverage, robust phases. The tightly controlled 2.6 µm diameter of the Accucore particles results in much lower backpressures than typically seen with sub-2 µm materials. For the analysis of large biomolecules, the Accucore pore size has been further optimized, and a C4 phase with reduced hydrophobic retention has been prepared. This 150 Å pore size enables effective analysis of molecules that are unable to penetrate small pore sizes, and the lower hydrophobicity allows elution of hydrophobic proteins that are too strongly retained on C18.

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Direct desorption of VOCs and SVOCs from leather furnishings **Markes International**

This Application Note demonstrates the direct desorption of volatile and semi-volatile organic compounds (VOCs and SVOCs) from leather furnishings, in order to identify the cause of discoloration. Troubleshooting problems affecting textiles and other furnishings can be extremely challenging for the analyst. Issues such as discoloration, odour, unsatisfactory or uneven resistance to wear, and inadequate waterproofing can potentially be caused by a wide range of external factors, as well as by product treatment or processing.

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Fast Analysis of Water Pollutant Pesticides **Knauer**

A very fast gradient method for the simultaneous determination of 13 pesticides which are known to be important water pollutants is presented in this application note. The high speed and reliability of this method applying the KNAUER PLATINblue UHPLC System make it well-suited for routine analysis. Reduction of analysis time to less than 8 minutes is achieved by employing the BlueOrchid C18 stationary phase with a 1.8 µm particle size filled in a 2 mm ID column. A binary high pressure gradient instrumentation is used at a flow rate of 0.6 mL/min in combination with a UV detector.

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Automated USP and EP GPC/SEC analysis of low molecular weight heparin (LMWH) **PSS**

Natural heparin is a polysaccharide and consists of molecular chains of varying lengths. Low molecular weight heparin (LMWH) consists of short chains and is used as anticoagulant in diseases that feature thrombosis and for prophylaxis against it. Because LMWH has more predictable anticoagulant effect and pharmacokinetics as well as less side-effects, it is recommended over unfractionated heparin. Various methods of heparin depolymerization are used to manufacture LMWH.

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Optimizing performance of the Agilent 1290 Infinity LC System using 1-mm id columns **Agilent Technologies**

The performance of the Agilent 1290 Infinity LC System was optimized for the analysis of peptides using 1-mm id columns. The 1290 Infinity LC System was equipped with an Agilent Ultra-low Dispersion Capillary Kit and an Agilent Max-Light Ultra-low Dispersion Cartridge Flow Cell. The experiments achieved the same or better performance compared to 2.1-mm id columns. The deployment of 1-mm id columns showed high sensitivity and resolution and reduced mobile phase consumption. In addition, the combination of 1-mm id columns with ESI-MS readout revealed high linearity and sensitivity of the analysis of HSA peptide standards.

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Copper, Nickel, Zinc and Common Cations in the Water-Steam Cycle of a Boiling Water Reactor (BWR) **Metrom**

Water chemistry of the water-steam cycle is crucial for maintaining plant reliability and for ensuring optimal plant operational conditions. Impurities such as corrosion products in ionic, colloidal, or oxide forms are ubiquitous in feedwater, condensate, and reactor coolant. This application shows the determination of sub-ppb levels of Cu, Ni, Zn and standard cations (e.g., Na⁺, NH₄⁺, Mg²⁺, Ca²⁺) in the water-steam cycle of a BWR.

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The Determination of Low Levels of Benzene, Toluene, Ethylbenzene, Xylenes and Styrene in Olive Oil Using a Turbomatrix HS and a Clarus SQ 8 GC/MS **Perkin Elmer**

Levels of benzene, toluene, ethylbenzene, xylenes and styrene (BTEXS) are a concern in olive oil. These compounds find their way into olive trees and hence into the olives and olive oil mainly as a result of emissions from vehicles, bonfires, and paints into ambient air near the orchards. Various methods have been developed to detect and quantify these compounds down to levels of 5 ng/g (5 ppb w/w). This application note describes an easy to perform method using PerkinElmer® Clarus® SQ 8 GC/MS with a TurboMatrix™ 110 headspace sampler to achieve detection limits below 0.5 ng/g.

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Large Volume Splitless Injection Using an Unmodified Split/Splitless Inlet and GC-TOFMS for Pesticides and Brominated Flame Retardants **Restek**

Large volume splitless injection for gas chromatography typically requires a special injection port, for example, a programmable temperature vaporizer (PTV), but an alternative setup using concurrent solvent recondensation—large volume splitless injection (CSR-LVSI) and a split/splitless injection port has been reported. This technique was used here, both with and without sample extract concentration, to analyze pesticides and brominated flame retardants in drinking water. When extract concentration was eliminated, good linearity and recovery results were

Toxtyper™ – a Comprehensive LC-MSⁿ Screening Solution for Clinical and Forensic Toxicology
Bruker

A major task for clinical and routine toxicology screening is the reliable, fast and comprehensive identification of drugs and drugs of abuse (DOA). Current techniques such as GC-MS, LC-UV/DAD and immunoassays have several limitations. Liquid chromatography tandem mass spectrometry (LC-MS/MS) is an emerging technology that is more specific than immunoassays, provides more information than LC-UV/DAD detection, and covers a broader range of compounds than GC-MS. Here we describe a robust and automated screening solution based on the latest LC-MSⁿ ion trap technology that promises to provide a combination of the highest performance LC-MS/MS and easy-to-use screening with the greatest transferability of results from lab to lab.

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Automated Solid Phase Extraction (SPE)-LC-MS/MS Method for the Determination of Acrylamide in Brewed Coffee Samples
Gerstel

In this study, we show that a manual SPE method used for the determination of acrylamide in brewed coffee can be converted to an autosampler-compatible cartridge format and automated using a robotic autosampler controlled by user-friendly software. Calibration standards prepared in freshly brewed green coffee (unroasted) resulted in a linear calibration curve ($r^2=0.99$) from 1 ng/mL to 500 ng/mL. Precision of the automated SPE-LC/MS/MS method was calculated as CV = 1.7 %.

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obtained while sample preparation time was reduced by over 1 hour. CSR-LVSI was also combined with extract concentration to achieve lower detection limits.

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Characterization of PLGA Using SEC-MALS-VIS
Wyatt Technology

Poly(lactic-co-glycolic acid) (PLGA) is a copolymer based on glycolic acid and lactic acid. The two monomer units are linked together by ester linkages and form linear polyester chains. The obtained product is biodegradable and biocompatible, and it is approved by the Food and Drug Administration (FDA) for production of various therapeutic devices as well as for drug delivery applications. The properties of PLGA can be tuned by the ratio of the two monomers and by its molar mass distribution.

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Development of an SPME-GC-MS Procedure for the Determination of Phthalate Esters in Ramen Noodle Flavor Packets
Supelco / Sigma-Aldrich

In June of 2011, food safety authorities in Hong Kong found phthalate ester contamination in a variety of imported food and drink products. Among these foods were several brands of ramen noodle kits. Specifically, there was concern with the presence of bis(2-ethylhexyl) phthalate (DEHP) in the oil-based flavor packets in these kits. The method currently used in China for the analyses of phthalate esters in foods requires gel permeation chromatography (GPC) as a cleanup step to remove fats and oils prior to GC-MS analysis. GPC cleanup is extremely effective. However, it is also a time consuming technique.

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